

AMENDMENTS TO THE CLAIMS

Please cancel Claim 1.

Please add Claims 2-58 as follows:

1. (Cancelled).
2. (New) A memory comprising:
 - a first defective memory element in a first row;
 - a second defective memory element in a second row;
 - at least one redundant row; and
 - a programmable circuit comprising a non-volatile memory for storing one or more values, wherein the programmable circuit uses the values to map the first defective memory element to a first location in the redundant row, the programmable circuit further configured to map the second defective memory element to a second location in the redundant row.
3. (New) The memory of Claim 2 wherein the stored values identify the first and second defective memory elements.
4. (New) The memory of Claim 2 wherein the values stored in the non-volatile memory are programmable.
5. (New) The memory of Claim 2 comprising a third defective memory element in a column.
6. (New) The memory of Claim 5 wherein the programmable circuit is further configured to map the third defective memory element to a third location in the redundant row.
7. (New) The memory of Claim 2 wherein the programmable circuit includes:
 - a comparator configured to compare a row address stored in the non-volatile memory with a provided row address; and
 - a multiplexer coupled to the comparator, to a selected row, and to the redundant row, the multiplexer configured to replace the first defective memory element with the first location in the redundant row when the row address stored in the non-volatile memory matches the provided row address.

8. (New) A memory comprising:
 - a first defective memory element in a first column;
 - a second defective memory element in a second column;
 - at least one redundant column; and
 - a programmable circuit comprising a non-volatile memory for storing one or more values, wherein the programmable circuit uses the values to map the first defective memory element to a first location in the redundant column, the programmable circuit further configured to map the second defective memory element to a second location in the redundant column.
9. (New) The memory of Claim 8 wherein the stored values identify the first and second defective memory elements.
10. (New) The memory of Claim 8 wherein the values stored in the non-volatile memory are programmable.
11. (New) The memory of Claim 8 comprising a third defective memory element in a row.
12. (New) The memory of Claim 11 wherein the programmable circuit is further configured to map the third defective memory element to a third location in the redundant column.
13. (New) The memory of Claim 8 wherein the programmable circuit includes:
 - a comparator configured to compare a column address stored in the non-volatile memory with a provided column address; and
 - a multiplexer coupled to the comparator, to a selected row, and to the redundant row, the multiplexer configured to replace the first defective memory element with the first location in the redundant column when the column address stored in the non-volatile memory matches the provided column address.

14. (New) A memory comprising:
at least first defective memory element and a second defective memory element located in different rows or columns;
an addressable group of redundant memory elements; and
a programmable circuit comprising a non-volatile memory configured to store values wherein the programmable circuit is controlled at least in part by the values stored in the non-volatile memory, the programmable circuit configured to map the first defective memory element to a first location in the addressable group of redundant memory elements, the circuit further configured to map the second defective memory element to a second location in the addressable group of redundant memory elements.
15. (New) The memory of Claim 14 wherein the addressable group of redundant memory elements is a redundant row of memory elements.
16. (New) The memory of Claim 14 wherein the first defective memory element is located in a first row, the second defective memory element is located in a second row and the addressable group of redundant memory elements is a redundant row of memory elements.
17. (New) The memory of Claim 14 wherein the addressable group of redundant memory elements is a redundant column of memory elements.
18. (New) The memory of Claim 14 wherein the first defective memory element is located in a first column, the second defective memory element is located in a second column and the addressable group of redundant memory elements is a redundant column of memory elements.
19. (New) The memory of Claim 14 wherein the first defective memory element is located in a first row, the second defective memory element is located in a first column and the addressable group of redundant memory elements is a redundant row of memory elements.
20. (New) The memory of Claim 14 wherein the first defective memory element is located in a first row, the second defective memory element is located in a first column and the addressable group of redundant memory elements is a redundant column of memory elements.
21. (New) The memory of Claim 14 wherein the values stored in the non-volatile memory identify the first and second defective memory elements.

22. (New) The memory of Claim 14 wherein the values stored in the non-volatile memory correspond at least in part to a provided row address that corresponds to a selected row of memory elements.

23. (New) The memory of Claim 14 wherein the programmable circuit includes:
a comparator configured to compare a row address stored in the non-volatile memory with a provided row address; and

a multiplexer coupled to the comparator, to a selected row, and to the redundant row, the multiplexer configured to replace the first defective memory element with the first location in the addressable group of redundant memory elements when the row address stored in the non-volatile memory matches the provided row address.

24. (New) The memory of Claim 14 wherein the values stored in the non-volatile memory correspond at least in part to a provided column address that corresponds to a selected column of memory elements.

25. (New) The memory of Claim 14 wherein the programmable circuit includes:
a comparator configured to compare a column address stored in the non-volatile memory with a provided column address; and

a multiplexer coupled to the comparator, to a selected column, and to the group of addressable redundant memory elements, the multiplexer configured to replace the first defective memory element with the first location in the redundant memory elements when the column address stored in the non-volatile memory matches the provided column address.

26. (New) The memory of Claim 14 wherein the non-volatile memory includes a lookup table that has a number of addressable locations, where the addressable locations are addressed by a provided row or column address, the lookup table providing one or more signals that indicates that the first defective memory element is to be replaced with the first location in the addressable group of redundant memory elements.

27. (New) The memory of Claim 26 wherein the lookup table further indicates that the second defective memory element is to be replaced with the second location in the addressable group of redundant memory elements.

28. (New) A memory with redundant memory elements, the memory comprising:
means for storing one or more values in a non-volatile memory;
means for using a first value in the non-volatile memory to map a first defective memory element from a first row or column to a first location in an addressable group of redundant memory elements; and
means for using a second value in the non-volatile memory to map a second defective memory element from a second row or column to a second location in the addressable group of redundant memory elements.
29. (New) The memory of Claim 28 wherein the stored values identify the first and second defective memory elements.
30. (New) The memory of Claim 28 wherein the first value and the second value relate to memory addresses.
31. (New) The memory of Claim 28 further comprising:
means for loading values in a non-volatile lookup table, where the values indicate whether a memory element is defective;
means for accessing the lookup table with a provided address; and
means for replacing the memory element corresponding to the provided address when the lookup table indicates that the memory element is defective.
32. (New) A method for replacing a defective memory elements of a memory with redundant memory elements, the method comprising:
storing one or more values in a non-volatile memory;
using a first value to map a first defective memory element from a portion of a first row or column to a first location in an addressable group of redundant memory elements; and
using a second value to map a second defective memory element from a portion of a second row or column to a second location in the addressable group of redundant memory elements.
33. (New) The method of Claim 32 wherein the addressable group of redundant memory elements is a redundant row of memory elements.

34. (New) The method of Claim 32 wherein the addressable group of redundant memory elements is a redundant column of memory elements.

35. The method of Claim 32 further comprising programming the values in the non-volatile memory.

36. The method of Claim 32 further comprising:

comparing the values stored in the non-volatile memory with a provided memory address; and

replacing the first defective memory element with the first location in the addressable group of redundant memory elements partly in response to a match between a stored value and the provided memory address.

37. (New) The method of Claim 32 further comprising:

storing a lookup table in the non-volatile memory, where the lookup table corresponds to a plurality of addressable locations;

loading values in the lookup table, where the values indicate whether a memory element is defective;

accessing a location in the lookup table corresponding to a provided address; and

replacing the memory element corresponding to the provided address when the value stored in the lookup table indicates that the memory element is defective.